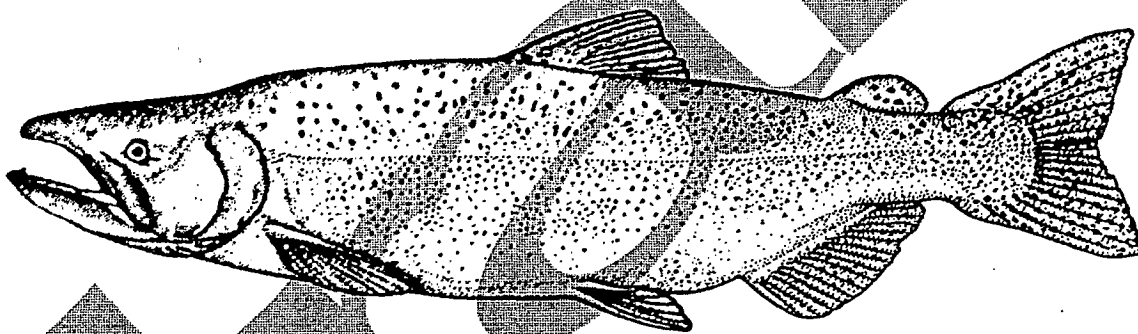


REPORT TO CONGRESS

Central Valley Project Improvement Act Department of the Interior Five Year Plan and Budget (FY 1999-2003)



Prepared by

The U.S. Fish and Wildlife Service and

Bureau of Reclamation

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1. Introduction

This report serves to meet requirements of fiscal year (FY) 1996 Energy and Water Development Appropriations language which directed the Secretary of the Interior to submit a report to Congress by February 1996 displaying Central Valley Project Improvement Act (CVPIA) priorities and activities for the five-year period from FY 1997 through FY 2001. The report is to be updated annually and submitted as part of budget justification materials prepared for appropriate Congressional committee(s). This is the second such report and covers the period from FY 1999 through FY 2003.

Throughout the planning process resulting in this report, there has been extensive coordination with other agencies, the Restoration Fund Roundtable¹ and other stakeholders, and the general public. Coordination included public workshops to discuss fish and wildlife resource problems; how the CVPIA authorized and directed actions to address these problems; development of priorities for funding and implementing actions; the budget and budget processes for the CVPIA going back to 1994; and extensive agency, Restoration Fund Roundtable, and public review of the widely circulated draft *USFWS Funding Priorities for the CVPIA* (USFWS, Dec 1994). Comments from all were considered and used to help develop this report.

2. Scope

This report contains Interior's priorities for implementation of various provisions of the CVPIA for the five year period from FY 1999 through FY 2003. Many provisions of the CVPIA will have been completed by the beginning of FY 1999, while other sections require no action, prioritization or budgeting to implement. Therefore, the scope of this report is limited to those sections and provisions of the CVPIA requiring action and budgeted funds for FY 1999 and beyond. These are primarily the fish and wildlife measures contained in section 3406 and certain provisions in Section 3408. The list of CVPIA sections to be evaluated in this report are displayed in Table 1.

The five year budget presented in this report assumes certain federal appropriations will be available each year from FY 1999 through FY 2002. For FY 1999, the President's budget request for Restoration Funds and for Water and Related Resources Appropriations are displayed. The Restoration Fund estimate for FY 1999 is displayed at \$49 million, the current estimate of the amount collectable under the authority of the CVPIA. The FY 1999 Water and Related Resources

¹ The Restoration Fund Roundtable was formed by interested stakeholder groups in California and represents some of the interests of agriculture, municipal and industrial groups, and the environmental community. It provides comment to Interior on various components of planning and implementation associated with the CVPIA.

Appropriation is displayed at \$28 million. For fiscal years 2000 through 2003, the Restoration Fund is displayed at the full amount authorized by the CVPIA, taking into consideration the three-year rolling average provision of the Act. The Water and Related Resources Appropriation is displayed as an amount that might reasonably be appropriated each year. Actual appropriations may vary.

The five year budget also displays anticipated State of California cost-share funding for various actions. State Proposition 204 provided \$93 million to help meet the State's share of costs for implementing some of the fifteen provisions of the CVPIA which have a cost-share requirement. The distribution of these funds among the various measures reflects the coordinated priorities of both parties.

Additionally, other funding sources will, to some extent, be available. These sources include non-federal CALFED funds, Salmon Stamp funds, Four Pumps Mitigation Funds, and others. Voluntary contributions from partners and other interests may also be available. However, because at this time Interior cannot estimate the amount or projects to which any of these other contributions might be applied, they are not displayed or evaluated in this report.

Table 1
CVPIA Sections to be Evaluated
for Implementation Between FY 1999 and FY 2003

Section	Description
3406(b)(1)	Anadromous Fish Restoration Program
3406(b)(1)	Habitat Restoration Program (other CVP Mitigation)
3406(b)(2)	Management of Dedicated CVP Yield (including pulse flows)
3406(b)(3)	Supplemental Water Acquisition Program
3406(b)(4)	Tracy Pumping Plant Mitigation
3406(b)(5)	Contra Costa Canal Pumping Plant
3406(b)(6)	Shasta Temperature Control Device
3406(b)(9)	Eliminate Flow Fluctuation Losses
3406(b)(10)	Red Bluff Diversion Dam Fish Passage Program
3406(b)(11)	Coleman National Fish Hatchery Rehabilitation and Keswick Fish Trap Modification
3406(b)(12)	Clear Creek Fishery Restoration
3406(b)(13)	Gravel Replenishment and Riparian Habitat Protection
3406(b)(14)	Delta Cross Channel and Georgiana Slough
3406(b)(15)	Old River Seasonal Barrier (evaluation of effectiveness)
3406(b)(16)	Comprehensive Assessment and Monitoring Program (CAMP)
3406(b)(17)	Anderson-Cottonwood Irrigation District Fish Passage
3406(b)(18)	Restore Striped Bass Fishery
3406(b)(19)	Shasta and Trinity Reservoir Carryover Storage Studies
3406(b)(20)	Glenn-Colusa Irrigation District (GCID) Pumping Plant
3406(b)(21)	Anadromous Fish Screen Program
3406(b)(22)	Agricultural Waterfowl Incentives Program
3406(c)(2)	Stanislaus River Basin Water Management Plan
3406(d)	Refuge Water Supply and Conveyance
3406(g)	Ecologic and Hydrologic Models
3408(h)	Land Retirement

3. Approach

In order to meet the purposes and fulfill the goals of the CVPIA, the Fish and Wildlife Service (Service) and the Bureau of Reclamation (Reclamation), on behalf of the Secretary of the Interior, intend to vigorously pursue implementation of the CVPIA's many specific provisions in an efficient, professional, collaborative, and open manner. This fundamental principal was employed in the development of the plan and will continue to be reflected in all our efforts to implement the CVPIA. In fulfilling that principal, seven basic procedural objectives have been identified to guide Interior's efforts. These are:

1. To achieve the stated goals and specific requirements of the CVPIA;
2. To implement the provisions of the CVPIA in a manner providing the greatest public benefit, consistent with its purposes;
3. To endeavor to minimize possible adverse impacts to affected interests;
4. To coordinate and, where possible, integrate CVPIA implementation with other related or similar non-CVPIA efforts;
5. To develop partnerships with others in implementing actions to achieve CVPIA goals;
6. To fully involve the public and stakeholders in the process of implementing the CVPIA and seek their input into decisions the Service and Reclamation must make in fulfilling our responsibilities; and
7. To utilize the funds available in the most efficient and cost-effective manner.

All of the fish and wildlife related provisions in the CVPIA are aimed at accomplishment of three basic restoration goals.

1. To make all reasonable efforts to at least double natural production of anadromous fish;
2. To provide water supplies to Central Valley refuges and other migratory waterfowl habitats; and
3. To mitigate for other identified adverse impacts of the Central Valley Project.

To achieve both our procedural objectives and our fish and wildlife restoration objectives, Interior has adopted an implementation approach consisting of two components: one based on biological principles; the other on non-biological principles primarily emphasizing administrative efficiency, partners, and public involvement.

3.1 Biological Principles

1. Implementation of CVPIA measures will be prioritized based primarily on biological benefits to be derived and on technical feasibility and readiness of the measure for implementation.
2. Natural habitat components and the restoration of ecosystem function and viability will be emphasized in the planning and implementation of fish and wildlife provisions of the CVPIA. With this emphasis, as opposed to a single species or site-specific approach, it is expected that actions will provide benefits to a greater variety of organisms over a broad geographical area, and promote self-sustaining ecosystem enhancement and stability.
3. Factors in the ecosystem that are known to be constraining or limiting to key populations of fish and wildlife will be addressed first. This requires that we focus on Central Valley fish and wildlife problems holistically and sequence our activities to first address any limiting factors. For example, if juvenile salmon out-migration mortality is the key factor limiting population abundance, it should be addressed prior to producing more juveniles when they would be subjected to the same limiting out-migration mortality.
4. Consistent with 1, 2, and 3 above, primary emphasis, subject to statutory constraints, will be given to sections and provisions of the CVPIA which are of greatest utility in solving the most important fish and wildlife problems in the Central Valley.
5. Consistent with the need to address as many limiting or constraining factors within the ecosystem as possible, Interior expects to develop packages or suites of projects in geographic areas or watersheds in order to maximize potential benefits.

3.2 Non-biological Principles

1. Deadlines and sunset provisions of the CVPIA will influence the implementation schedules and budget requests for certain measures, irrespective of a measure's biological priority ranking.
2. The Service and Reclamation will seek additional sources of funds to facilitate implementation of CVPIA measures and the attainment of its goals. Although the Restoration Fund will remain the primary funding source, funds will also be requested in agency budgets to expedite implementation of key provisions. Assistance from other agencies or funding sources will also be sought. However, should requested funding from agency budgets or other sources not materialize, Restoration Funds will be applied based on priority of the proposed action.
3. To the greatest extent possible, consistent with its requirements, partnerships with others will be developed to help implement provisions of the CVPIA. Partners can bring expertise, financial resources, or additional authority that can greatly facilitate our efforts. However, it is recognized that the interests and priorities of prospective partners may not coincide precisely with CVPIA priorities and that partnerships may therefore influence implementation of CVPIA measures. The benefits of such partnerships will be balanced against the degree to which the diverse interests and priorities of prospective partners may limit or delay implementation of priority CVPIA measures.
4. Extensive coordination with other related non-CVPIA programs will make most efficient use of scarce resources and avoid overlap of efforts. For example, there has been and will continue to be very close coordination with the CALFED program. This program was initiated in December, 1994 as part of the Bay/Delta Accord to supplement the establishment and implementation of water quality objectives for the estuary by improving habitat conditions for fish and wildlife both within and upstream of the estuary. We have coordinated all of our efforts with them and partnered with them on many. There will also be extensive coordination with California Department of Fish and Game's efforts to restore salmon and steelhead populations, ensuring optimal use of limited funds available to each agency.
5. Maximum flexibility will be maintained in the allocation of Restoration Funds in order to be able to react to unanticipated opportunities and changing conditions or circumstances. This is especially important since limited authority currently exists to implement some programs and measures without relying, in large part, on the authority of others or on the willingness of potential partners. Provisions of the CVPIA that will be most opportunistic and require the greatest budgetary flexibility include the acquisition of supplemental water supplies, land retirement, and the screening of unscreened or inadequately screened diversions.

6. Whenever opportunities exist, implementation of CVPIA programs and measures will be expedited by streamlining regulatory and environmental compliance processes. For example, maximum use will be made of general permits whenever compliance with Section 404 of the Clean Water Act is likely to be required. Programmatic environmental documents will also be used to the greatest extent possible to cover multiple actions of the same or similar sort.

3.3 Partnerships and Public Involvement

The Service and Reclamation believe that implementing the CVPIA through partnerships will be the most effective means for success. Voluntary collaborations to achieve mutual goals and objectives will accelerate accomplishments, increase available resources, reduce duplication, encourage innovative solutions, improve communication, and increase public involvement and support through shared authority and ownership of restoration actions.

Public support is both a product and a prerequisite of partnerships. Public support for an action will facilitate implementation and attract partners for future actions. The Service and Reclamation will seek opportunities for the public to assist in planning and implementing CVPIA restoration actions.

There are two levels of public involvement for CVPIA implementation. The first level is programmatic and involves planning a comprehensive program. At this level, all areas of the Central Valley are included. The second level is action-specific and involves implementing specific measures in individual watersheds.

Cooperation through partnerships is very important to the success of the CVPIA in restoring fish and wildlife resources throughout the Central Valley. CVPIA implementation is, and will continue to be, coordinated with existing and ongoing restoration efforts such as the State's efforts to restore salmon and steelhead populations, the State Water Resource Control Board's Water Quality Control Plan, and the CALFED Bay-Delta Program process striving to find long-term solutions in the Delta. At a more local level, the Mill Creek Watershed and Deer Creek Conservancies are good examples of local watershed partnerships successfully working in the Central Valley.

The Service and Reclamation encourage potential partners to enter into cooperative relationships to implement appropriate CVPIA measures. Through various mechanisms, the Service and Reclamation can provide funds and services to these partners, allowing for their completion of pre-approved restoration actions. The CVPIA [Section 3407(e)] provides the Secretary the flexibility to use several mechanisms for funding non-Federal entities by stating:

"If the Secretary determines that the State of California or an agency or subdivision thereof, an Indian tribe, or a non-profit entity concerned with restoration, protection, or enhancement of fish, wildlife, habitat, or environmental values is able to assist in implementing any action authorized by this title in an efficient, timely, and cost effective manner, the Secretary is authorized to provide funding to such entity on such terms and conditions as he deems necessary to assist in implementing the identified action."

State agencies: The California Departments of Fish and Game and Water Resources, and the State Water Resources Control Board, The Reclamation Board, and other State agencies have expertise, abilities, experience, and are willing to assist in implementing many restoration actions. The Service and Reclamation can, and will where applicable, enter into procurement arrangements including cost-share agreements, memoranda of understanding, grants, and cooperative agreements with State agencies.

Local agencies and groups: Watershed conservancies, conservation groups, water districts, non-profit entities and individual property owners can help implement restoration actions. Agreements can be reached with these groups or funds and CVPIA services can be directed to them through memoranda of understanding, grants, cooperative agreements, and challenge cost-sharing. In areas with local support but no watershed conservation group, the Service and Reclamation may provide funds and assistance in forming one. Information on forming and supporting local watershed conservation groups is contained in the *California Coordinated Resource Management and Planning Handbook* (1990).

Native American tribes: The United States holds many assets in trust for Native American tribes or individuals. The Secretary serves as trustee for these assets. This responsibility is defined by treaties, executive orders, statutes, regulations, and court decisions. Within the CVP service area, the Hoopa Valley Tribe has resource co-management responsibility for its natural resources. The Tribal Fisheries Department staff has expertise in fisheries management and restoration, hydrology, and channel and floodplain maintenance flows in the Trinity River. Agreements have been reached between the Department of the Interior and the Hoopa Valley Tribe in the implementation of CVPIA actions.

4. Program Focus for FY 1999-2003

It is Interior's intent to implement the CVPIA in a purposeful, proactive manner, addressing first those things that are most important, most urgent, or that will provide the greatest biological benefit. To do this, we will develop and identify biological "focus areas" to guide our efforts over the short-term (3-5 years). These focus areas will be an integration of three parameters: the species of greatest concern; the factors most influencing those fish and wildlife populations; and the geographic areas

or habitats critical to those populations. Interior expects to channel its efforts to where these three major parameters overlap, not to the exclusion of other species, factors, or habitats, but rather to "focus" a significant portion of time and money. It must also be recognized that we may not be able,

for a variety of reasons, to proceed exclusively in that fashion. For example, there may not be adequate authority, funding, or information to implement a particular action immediately, even if it is determined to be a high priority. In some cases, deadlines or sunset provisions in the CVPIA may influence the implementation schedule and budget for certain measures irrespective of the measures' inherent priority ranking. Finally, financial considerations must be taken into account, such as cost efficiencies realized by continuing rather than interrupting on-going projects, and the availability of cost-sharing partners.

As mentioned previously, the CVPIA provided three restoration goals requiring focus and action by the Secretary: anadromous fish restoration; water supplies for Central Valley refuges and other waterfowl habitats; and mitigation for other CVP fish and wildlife impacts. Each required action found within the CVPIA is related to others in that they are all designed to collectively mitigate for CVP impacts and enhance fish and wildlife resources.

4.1 Anadromous Fish Species

Since settlement of California's Central Valley in the mid-1800's, populations of native anadromous fishes have declined dramatically, so much so that some stocks are on the verge of extinction. Historically, many factors contributed to this decline including hydraulic mining, ocean and freshwater harvest, water quality degradation, the introduction of exotic fish species, construction of dams, dikes and levees, water diversions, and river and stream channelization.

Table 2 contains status and trend information for various species and races of anadromous fish addressed in the CVPIA. No priority is suggested in the order represented on this table. However, our intent will be to focus first on those species in greatest decline or in greatest danger of extirpation over all or part of their range in the Central Valley. This will be reevaluated throughout implementation of the CVPIA, allowing for adaptive management as status and conditions change.

Table 3 identifies specific limiting factors (also called stressors), in estimated order of significance, affecting anadromous fish species in the Central Valley of California as determined by the Service. This list, while not exhaustive or all-inclusive, represents what the Service believes to be major problems influencing populations and critical habitats of various species and races of anadromous fish in the Valley today. Table 3 takes into account improvements in habitat and project operations that have been made up to the present time. It has to be recognized that not all factors influence all species all of the time throughout their range in the Valley. We have attempted to capture, therefore,

the relative significance of various factors to each species and race, and summarize that information into an overall ranking for anadromous fishes as a group.

Table 2
Anadromous Fish Status and Trends

Species or Race	Geographic Extent				Status and Trends (1967-1991) ^{1/}
	SRB	SJRB	Bay/Delta	Delta Tributaries	
Sacramento fall-run chinook salmon (Proposed to List)	X		X	X	Annual fluctuation between 100,000 and 300,000 adults.
San Joaquin fall-run chinook salmon (Proposed to List)		X	X		High annual fluctuation between 900 and 77,000 adults
Late Fall-run chinook salmon	X	O	X		75-80% losses, high annual fluctuation between 7,000 and 35,000 adults.
Winter-run chinook salmon (Federal Endangered)	X		X	O	Over 90% decline, current population below 500 adults annually.
Spring-run chinook salmon (Proposed to List)	X		X		Low population and high degree of annual fluctuation between 770 and 28,000 adults.
Steelhead (Federal Proposed Endangered or Threatened by area)	X	O	X	O	80-90% losses, annual fluctuation between 3,500 and 25,000 adults.
Striped bass	X	O	X		60-70% decline, annual fluctuation between 680,000 and 1.7 million adults.
White Sturgeon	X	X	X		60-70% losses, annual fluctuation between 20,000 and 100,000 adults.
Green Sturgeon (Federal Species of Concern)	X	O	X		Continuous low annual occurrence between 500 and 1,000 adults.
American shad	X	O	X	O	Over a 50% decline from peak abundance during the period.

^{1/} = Source - Central Valley Anadromous Fish Annual Run-Size, Harvest, and Population Estimates, 1967 Through 1991, CDFG, August 1994 Revision

SRB = Sacramento River Basin

SJRB = San Joaquin River Basin

Bay/Delta = San Francisco Bay and Sacramento-San Joaquin River Delta area

Delta Tributaries = Calaveras, Mokelumne, and Cosumnes rivers

X= Indicates primary occurrence

O= Indicates minor or potential occurrence

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Table 3
Anadromous Fish Limiting Factor Importance

Anadromous Fish Limiting Factors (in current estimated order of significance) ^{1/}	Limiting Factor Significance by Species and/or Race									Summary Rating of Factors ^{2/}
	SJFCS	SFCS	LFCS	WRCS	SRCS	ST	SG	SB	AS	
Delta Conditions - Delta inflow, outflow, export pumping, water temperature and quality, residence time, and flushing characteristics have all been modified.	H	H	H	H	H	H	H	H	H	High
Instream Flows and Temperatures - Frequency, magnitude, and timing of flows, upstream of the Delta, have been greatly modified (includes flow fluctuations).	H	H	M	M	H	H	H	H	H	High
Quality of Accessible Stream Channel and Riparian Habitat - Diminished quality limits capability of available habitat to meet essential species needs such as spawning, rearing, feeding, predator avoidance, etc.	H	H	H	H	H	H	M	M	M	High
Blockage of or Reduced Access to Suitable Habitat - Quantity of available habitat has been greatly reduced by blockages and access to remaining habitats are restricted by the lack of, or inoperative fish ladders, low flows, etc.	H	H	H	H	H	H	H	M	M	High
Availability of Data on Which to Base Fisheries Management Decisions - Essential for planning and implementation.	M	M	M	M	H	H	H	M	H	Moderate
Unscreened or Inadequately Screened Diversions - Causes entrainment, impingement, and losses from handling fish at facilities.	M	H	M	M	M	M	?	M	M	Moderate
Spawning Gravel Availability/Suitability - Further limits anadromous fish production capabilities.	M	M	M	M	M	M	?	NA	NA	Moderate
Pollution/Water Quality - Degraded water quality (including toxics, sedimentation, turbidity, etc.) affects all species.	H	M	M	M	M	M	H	M	M	Moderate
Poaching/Excessive Sport and Commercial Harvest - Harvest and escapement goals need to be carefully balanced to support legitimate consumptive uses and population restoration efforts.	M	L	L	L	M	L	M	L	L	Low
Excessive Predation - Increased predation, due to alteration of habitat conditions and/or adverse management practices, upsets natural predator/prey relationships.	M	L	L	L	L	L	?	L	L	Low
Introduction/Presence of Nuisance Exotic Species - Compete with native fish species for food, cover, spawning substrate and other biological functions.	L	L	L	L	L	L	L	L	L	Low
Disease - Potency tends to increase as species resistance is reduced due to stress caused by other limiting factors.	L	L	L	L	L	L	L	L	L	Low

^{1/} = Assumes all existing Biological Opinions are in place^{2/} = Determined by USFWS

H = Highly significant limiting factor for species and/or race

M = Moderately significant limiting factor for species and/or race

L = Low significance as limiting factor for species and/or race

NA = Not Applicable

? = Unknown

SFCS = Sacramento Basin fall-run chinook salmon

SJFCS = San Joaquin Basin fall-run chinook salmon

LFCS = late fall-run chinook salmon

SRCS = spring-run chinook salmon

WRCS = winter-run chinook salmon

ST = steelhead

SG = sturgeon (white and green)

SB = striped bass

AS = American shad

Focus for Anadromous Fish Restoration FY 1999-2003

Based on those species of greatest concern at this time, our assessment of factors limiting natural production of those species, and with an emphasis on those geographic areas where the greatest number of species and factors can be addressed concurrently, we have developed the following focus for the next 3-5 year period. As discussed above, this focus describes how and where Interior hopes to concentrate the most significant portion of its efforts between Fiscal Years 1999 and 2003. This will not be to the exclusion of other concerns or opportunities for solution to other anadromous fish problems, but will be our emphasis for the five year period. Anadromous fish species and race prioritizations will be reevaluated throughout implementation of the CVPIA.

- Conditions in the Sacramento-San Joaquin Delta are among our highest priority focus areas because of its highly altered and degraded condition. All species and races of anadromous fish migrate through the Delta as adults moving to upstream spawning areas and juveniles on their way to the San Francisco Bay and open ocean. Additionally, juveniles of many anadromous species rear in the Delta. Emphasis will be on offsetting the effects of the CVP and SWP export facilities (i.e., entrainment, impingement, diversion, and increased predation) and in screening other major diversion facilities. The 1994 Bay-Delta Accord² provided improvement for some, but not all, species and races of anadromous fish. Steelhead, and spring-run and San Joaquin fall-run chinook salmon, in particular, remain in urgent need of additional protections.
- A primary focus of our 1999-2003 efforts will be restoration actions for Sacramento River basin spring-run chinook salmon (proposed for federal listing) and steelhead (federally listed as threatened). Emphasis will be on the acquisition of additional instream flows; riparian and shaded riverine aquatic habitat restoration, primarily on tributaries; improved access to upstream habitat; and the reduction of losses at diversions, especially on the mainstem (below Red Bluff) and tributaries of the Sacramento River and the Yuba River. Tributaries to the upper Sacramento River with the potential for sustaining natural production and promoting genetic diversity for these species include Clear, Battle, Antelope, Mill, Deer, Big Chico, and Butte creeks. In addition, the American River will be emphasized because it provides habitat for steelhead as well as several other anadromous species.
- Winter-run chinook salmon, although already afforded protection under the Endangered Species Act, have not shown substantial progress towards recovery. When possible, measures additional to those required by the Endangered Species Act will be applied. Actions will

² 1994 result of the Principles of Agreement on Bay-Delta Standards process.

continue or increase as appropriate and will focus on providing additional flows when necessary, modification of facility operations, improvement of instream temperatures, reductions in diversion, and the restoration of spawning habitat.

- Fiscal Year 1999-2003 actions will also emphasize San Joaquin River Basin fall-run chinook salmon. Central Valley fall-run chinook salmon have been proposed for federal listing as threatened or endangered and the San Joaquin population is particularly worrisome. As indicated, population levels fluctuate dramatically and have been at extremely low levels for many years. Good adult returns appear significantly correlated to high springtime flows for outmigrating juveniles down the mainstem and through the Delta 2½ years prior. Restoration actions will focus on providing additional flows on tributaries to the mainstem and past the Delta pumps; restoration of river and tributary channels, spawning gravels and riparian cover; and the elimination of predator ponds on tributaries.

4.2 Central Valley Refuges and Other Waterfowl Habitats

Central Valley wetlands have declined more than 90 percent from historic levels (Table 4). Waterfowl and other wetland dependent species, including many listed species, have been noticeably affected, prompting inclusion of wetland restoration measures in the CVPIA to deal with the long-term problems of an insufficient habitat base and inadequate water supplies for remaining Central Valley wetlands. Additional water will allow wetland managers to dramatically expand and enhance wetland habitat.

Focus for Central Valley Waterfowl Habitat FY 1999-2003

The primary focus over this five year planning period will be to provide the requisite firm water supplies through long-term contractual agreements to Central Valley National Wildlife Refuges, State Wildlife Management Areas, the Grasslands Resource Conservation District, and the San Joaquin Basin Action Plan lands and to develop or acquire the conveyance capacity necessary to deliver those supplies. Full supplies to the areas are authorized to be provided by October, 2002. In addition, we will attempt to maximize, consistent with priorities and other demands on CVPIA funds, the acreage of additional wetland habitats that can be achieved by providing incentives to farmers to keep agricultural fields flooded in winter for waterfowl purposes. This program will expire by the year 2002 unless otherwise re-authorized and funded, and it is our intent to achieve the maximum potential benefit for the resource while authority still exists.

4.3 Other Fish, Wildlife and Associated Habitats

The Central Valley of California contains some of the most varied natural habitats and highest biodiversity in North America (Barbour et al., 1991, 1993). Many of these resources have been severely reduced or degraded by human settlement, population growth, and economic development. With the development of the Federal and State water projects, thousands of acres of upland, wetland, and riparian habitats were inundated by construction of major reservoirs; wetland, riparian, and aquatic habitats downstream of reservoirs were further degraded due to associated changes in timing and extent of river flows; and additional upland and seasonal wetland habitats were converted to agricultural, municipal, and industrial uses as a result of additional water made available by these projects. Fish and wildlife species native to the Central Valley ecosystem are greatly dependent on native habitats for meeting their biological needs. As the extent of these native habitats have declined over the years, so have the extent of native fish and wildlife dependent on them. Because of this connection, native habitat trends can be used as an indicator of associated species well-being for estimating species trends. It can also be reasonably assumed that protection and restoration of these habitats will benefit dependent native species, including many listed under the federal and state Endangered Species acts, and some on the verge of extinction.

Table 4 provides estimates of loss for native habitats in areas associated with Central Valley Project construction, operation, and water supplies³. This is not to infer the Central Valley Project "caused" these losses, but rather to display those habitat types and losses to which it is believed the Project has contributed. These habitats were determined to be priorities as a result of their significant reductions, fragmentation, and the existence of associated special-status species⁴. An analysis of existing databases indicate that approximately 187 special-status species occur in these habitat types within and adjacent to the areas directly affected by construction and operation of the Central Valley Project and areas receiving CVP water supplies. Another 640 species are considered species of concern.⁵ This rough quantitative analysis provides insight into the magnitude of the ecosystem-level dilemma decision makers must face in California's Central Valley and Central Coast areas.

³ CVP service areas currently include the Central Valley and areas of the Central Coast of California.

⁴ "Special-status species" are those species federally listed, proposed for listing, or candidates for listing under the Endangered Species Act of 1973, and/or those listed as threatened or endangered by the State of California.

⁵ For this purpose, "species of concern" are those species formerly considered category 2 or category 3 candidates for listing under the Endangered Species Act; those identified but not listed as threatened or endangered under the California Endangered Species Act; plant species in severe decline as identified by the California Native Plant Society Database; and certain migratory bird species identified as being in severe decline by the California Natural Diversity Database (CNDDB).

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Program Focus

Without efforts to address the current trend, like those provided by the Central Valley Project Improvement Act, additional species will no doubt be added to the special-status list.

Table 4

DRAFT Habitat and Representative Species Associated with Construction and Operation of the Central Valley Project

Priority Habitats	Geographic Extent	Estimated Habitat Trends ^{1/} and Representative Species, Including Special-Status Species
Hardwood Woodlands	Central Valley to 9,000 feet, and Central Coast from sea level to 5,000 feet where soil types allow the formation of a tree layer dominated by oaks. Typically found in sloped areas, valleys, raised stream benches and terraces with shallow, moderately to excessively drained soils.	Habitat losses associated with CVP construction and deliveries have occurred at various locations. Although the majority of the losses occurred prior to construction of the CVP, significant local losses have occurred both within the Central Valley and in the Central Coast since 1940. Many upland species like deer, bear, and the California quail frequent this habitat. Hardwoods are essential for many special-status species including the Shasta salamander, Bohart's blue (butterfly), and the Greenhorn adobe-lily.
Chaparral	Central Valley and Central Coast areas from 3,000 to 10,000 feet generally on north facing slopes where soil type and hydrology allow for the presence of woody, often hard-leaved shrubs.	Over 50% decline in some areas. For example, El Dorado County, receiving some of its water supply from the CVP, has experienced rapid urbanization and related losses in chaparral and associated habitats. This has resulted in the listing of several plant species including Stebbins' morning glory, Pine Hill ceanothus, Pine Hill flannel bush, El Dorado bedstraw, and Layne's butterweed.
Riparian	Central Valley and Central Coast areas from sea level to 8,000 feet associated with water sources and containing various tree and shrub species.	Over 90% decline compared to historic levels with additional losses in quantity and quality over the last 50 years. CVP impacts were estimated to have occurred as a result of facility construction and modification of flow patterns below dams. Riparian habitats are one of the most productive areas for migratory bird species. Riparian-endemic special-status species include the western yellow-billed cuckoo, southwestern willow flycatcher, and riparian brush rabbit.
Alkali Desert Scrub	Limited to the southern and western part of the San Joaquin Valley where historic soil condition in remaining relatively unimpacted sites, allow for its continued existence.	Decreased by as much as 68% compared to historic levels, of which 240,000 acres may have been lost since the 1940's. Many historic sites for this habitat are now converted to agriculture and/or urban development, partially a result of CVP water deliveries. Essential for many special-status species including the San Joaquin kit fox, kangaroo rats (spps.), and the blunt-nosed leopard lizard.
Grasslands	Central Valley and Central Coast areas from sea level to about 3,900 feet within flat plains to gently rolling foothills. These areas contain a much different vegetation composition than during historic conditions ^{2/} .	Decreased by over 50% from historic levels. Within the Central Valley, nearly 2,000,000 acres have been lost since the 1940's within areas receiving CVP water. Grassland dependent species include the coyote, badger, and migratory birds such as the western meadowlark. Special-status species include the Aleutian Canada goose, San Joaquin kit fox, and California tiger salamander.
Wetlands	Central Valley and Central Coast areas from sea level to areas above 5,900 feet where soils are saturated or at least periodically flooded.	Over 90% loss from historic levels with an estimated 400,000 acre loss since the 1940's within areas receiving CVP deliveries. Wetland dependent species include waterfowl, shorebirds, and a host of mammals like the racoon. Representative special-status species include the giant garter snake, California red-legged frog, tricolored blackbird, and the salt marsh harvest mouse.
Vernal Pools	Central Valley-wide in areas with an impervious substrate insuring a perchable water table. Typically located in grassland areas.	Due to agricultural and development practices Central Valley-wide, several associated plant and invertebrate species have been federally listed, including several species of fairy shrimps, the vernal pool tadpole shrimp, and Sacramento Orcutt grass.
Central Valley Aquatic Habitats	Central Valley and Central Coast areas from sea level to the top of watersheds.	By actions including the construction and operation of the CVP, the natural hydrology of the Central Valley and Central Coast areas has been profoundly changed. These changes have resulted in the alteration of estuarine habitat hydrology and productivity; while impacts to riverine habitats include the inundation and adverse modification of hundreds of river miles, and the loss of access for many species to thousands of river miles. Aquatic habitat-dependant species include resident fishes, the beaver, river otter, and American dipper. Special-status species inhabiting these areas include the bald eagle, Shasta crayfish and delta smelt.

^(1/) = Source of trend estimations:

- GIS evaluations using digitized Wieslander (1945) 1:1,000,000 scale maps compared to GAP Program digital information from 1990 LANDSAT Thematic Mapper satellite imagery (approx. 1:100,000 scale).
- Existing literature - Frayer et al. 1989; Katibah 1984; Central Valley Habitat Joint Venture 1990; various CDFG documents.

^(2/) = Today, most existing grassland areas in California's Central Valley consist primarily of nonnative grass species (greater than 99%). Less than 1% of remaining grassland areas in the Central Valley contain enough native grass species, in aggregate, to be labeled either valley sacaton or valley needlegrass grasslands within publicly released and available GAP Program digital data (GAP, 1996).

Focus for Other Fish, Wildlife and Associated Habitat Mitigation FY 1999-2003

The initial focus of the Habitat Restoration Program [3406 (b)(1) "other"] will be based on our ranking of habitats and species of concern, our assessment of factors limiting native fish, wildlife, and associated habitats, and geographic areas where those habitats, species, and factors converge to the greatest degree. This will not be to the exclusion of other concerns or opportunities, but will be our emphasis for the five year period from FY 1999 to 2003. Species and habitat prioritizations will be reevaluated throughout implementation of the CVPIA.

- Habitats known or believed to have experienced the greatest percentage decline in quantity and quality since construction of the CVP, and whose impacts can be attributed, at least partially, to its construction and operation⁶, will be a focus for the Habitat Restoration Program. These habitats include riparian, alkali desert scrub, wetlands (including vernal pools), chaparral (including El Dorado County gabbro soil habitats), hardwood woodlands, grasslands, and aquatic habitats.
- Populations of native species impacted by the CVP, not specifically addressed in other portions of section 3406 of the CVPIA, will be addressed in the Habitat Restoration Program. Initial focus will be given to federally-listed, proposed or candidate species, other non-listed species of special concern including resident fish and migratory birds, and other native wildlife species associated with the habitat types listed above.

4.4 Additional CVPIA Provisional Benefits

In addition to the three biological areas of emphasis described above, other actions under Section 3406(b), 3408(h), and other sections of the CVPIA will additionally enhance habitat for fish and wildlife resources, including endangered species. As habitat and diversity improves, the overall quality of the entire ecosystem will benefit.

4.5 Focus Summary

In summary, for the period from FY 1999-2003, implementation of the CVPIA will focus on species and habitats impacted by the Central Valley Project, and believed to have the highest biological priority for restoration efforts during that period. Anadromous species have experienced devastating impacts, most significantly in the Sacramento-San Joaquin River Delta. For these species, this five year plan focuses on fixing flow, temperature, habitat, predator, and diversion related problems with

⁶ Based on direct and indirect losses of habitat from CVP facility construction and operation, and the associated expansion of irrigation.

an emphasis on the Delta. The focus for Central Valley refuges and other waterfowl habitat will be on providing Level 2 and appropriate Level 4 water supplies, 2/3 of the water supplies necessary for San Joaquin Basin Action Plan lands, and incentives which will encourage farmers to flood fields for waterfowl. The focus for other fish, wildlife, and habitats during this period will be on restoring, protecting, and better managing highly impacted habitats and/or those necessary for special-status species within the Central Valley.

5. Considerations for Ranking Specific Actions

To further assist in the ranking of specific actions and prioritizing measures within any program focus, a list of considerations was established (Table 5). It should be noted that these considerations are guidance and not rigid criteria. The list is not all inclusive, and the considerations will not replace independent agency judgement or public input when developing priorities, budgets, or implementation schedules.

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Table 5
Considerations for Ranking Specific Actions
for the Central Valley Project Improvement Act

A. Biological Resource Considerations

- **Magnitude of Benefits to Biological Resources:** Programs/projects with the greatest biological benefit and which address major limiting/constraining factors will generally receive the highest priority.
- **Benefits to Special-Status Species:** Programs/projects which benefit species of special concern will generally be a higher priority than those which do not.
- **Ecosystem or Multiple Species Benefits:** Programs/projects which have ecosystem, community, or multiple-species benefits will generally be a higher priority than those with only site-specific or single-species benefits.
- **Protection/Restoration of Natural Habitats and Habitat Values:** Programs/projects that restore and/or protect natural habitats or habitat values will generally be a higher priority than those that do not.
- **Long-term Benefits:** Programs/projects which have continuing or long-term benefits will generally be a higher priority than those which provide only one-time or short-term benefits.
- **Immediate Benefits:** Programs/projects which result in immediate biological benefits will generally be a higher priority than those which have delayed biological benefits.
- **Effectiveness:** Programs/projects that are expected to be biologically effective will generally be a higher priority than those whose effectiveness is questionable.
- **Permanence and "Mitigability" of Adverse Impacts:** Programs/projects for which adverse environmental impacts are reversible and mitigable will generally be a higher priority than those with irreversible or unmitigable adverse impacts.
- **Studies/Investigations:** Studies will generally receive a lower priority than implementation actions unless the study is a necessary precursor to an implementation action.

B. Implementation Considerations

- **Continuing/Ongoing Efforts:** Programs/projects that are continuing or ongoing will generally be a higher priority than new starts.
- **Technical Feasibility:** Programs/projects which can be implemented using proven and existing technology will generally be a higher priority than those which rely on unproven or experimental technology.
- **Timeliness:** Programs/projects which can be implemented in a timely fashion will generally be a higher priority than those where protracted delays are anticipated.
- **Partnerships/Opportunities:** Availability of cost-sharing funds, and opportunities to implement programs/projects in partnership with other agencies or organizations should be considered when developing priorities. Those with willing partners will generally have a higher priority.
- **"Implementability":** Legal, regulatory, or technical obstacles to implementation should be considered when establishing priorities.
- **Public Support:** The degree of public support for a project or a proposal should be considered in establishing priorities.
- **Compatibility:** Programs/projects which are compatible with other programs or projects, are part of an integrated program, or which have synergistic effects with ongoing programs will generally be given a higher priority than those that do not or which conflict with ongoing programs. Interdependence and sequencing will be a prime consideration in establishing priorities or scheduling activities.

C. Economic Considerations

- **Economic Effects:** Programs/projects that have positive economic effects will generally be a higher priority than those which have negative economic effects.
- **Project Costs:** The total cost, cost effectiveness, and ongoing (O&M) costs should be considered when developing priorities. Programs/projects with a greater cost effectiveness will generally be a higher priority than those with lower cost effectiveness.
- **Impact to Water Supply:** Programs/projects which benefit or have less adverse impact on water supply for project purposes will generally be a higher priority than those which adversely affect water supply.
- **Impact to Water Quality:** Programs/projects which benefit water quality for all uses will generally be a higher priority than those which do not.
- **Impact to Power:** Programs/projects which benefit or have less adverse impact on project power generation will generally be a higher priority than those which adversely affect power generation.
- **Immediate Benefits:** Programs/projects which have immediate benefits to water supplies and/or power generation will generally be a higher priority than projects which have only delayed benefits.

6. Implementation Overview by Provision of the CVPIA from FY 1998 to FY 2002

This section of the report provides a general overview of CVPIA provisions requiring both planning and funding in FY 1999 and beyond, and further defines the process to meet program focuses described in section 4 of this report. The discussion includes an explanation of overall goals and objectives for each section; Interior's restoration focus for each section for the five year period FY 1999-2003, a general summary of the types of actions proposed for the planning period, and a description of the biological benefits we expect to realize.

3406(b)(1) Anadromous Fish Restoration Program: Section 3406(b)(1) of the CVPIA requires the Secretary to "...develop within three years of enactment and implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained during the period of 1967 - 1991..." Section 3406(b)(1) also states that "this goal shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool." Further, Section 3406(b)(1)(A) requires that the program "give first priority to measures which protect and restore natural channel and riparian habitat values through habitat restoration actions, modifications to Central Valley Project operations, and implementation of the supporting measures mandated by this subsection; shall be reviewed and updated every five years; and shall describe how the Secretary intends to operate the Central Valley Project to meet the fish, wildlife and habitat restoration goals and requirements set forth in this title and other project purposes."

The Service and Reclamation are approaching implementation of this directive through development of an Anadromous Fish Restoration Program (AFRP). The term "AFRP" is the umbrella term for all of the components of Interior's efforts to double the natural production of anadromous fish, not just those encompassed under Section 3406(b)(1).

Many of the efforts to restore anadromous fish populations are specifically authorized by other sections of the CVPIA. Those actions, as well as the short-term objectives, proposals, and anticipated resource accomplishments, are discussed under the appropriate section headers below.

The specific objectives, proposals, and anticipated accomplishments that are discussed in this section of this report are limited to those efforts that are not specifically authorized by other sections of the CVPIA.

The document, *Anadromous Fish Restoration Plan -- A Plan to Increase Natural Production of Anadromous Fish in the Central Valley of California*, was developed by the Service in consultation with a core group of State and Federal biologists that were assisted by teams of scientists and resource managers familiar with life histories and habitat requirements of the various species and races of anadromous fish. The AFRP draft plan was released for public review and comment on December 18, 1995.

Interior released a Revised Draft Restoration Plan for the AFRP in June 1997. The Restoration Plan presents the overall goal, objectives, and strategies of the AFRP and describes how the AFRP identified and prioritized nearly 300 reasonable actions and evaluations. The Restoration Plan is a programmatic-level description of the AFRP, and will be used to guide implementation of all sections of the CVPIA that contribute to the goal of making all reasonable efforts to at least double natural production of anadromous fish. The AFRP was also used to help develop guidelines and objectives for use of the water management tools provided by the CVPIA. These guidelines and objectives were used in developing alternatives for the Programmatic EIS for the CVPIA, and continue to form the basis for discussion among various parties interested in Interior's efforts to develop a long-term water management plan.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

Consistent with the focus described in section 4 above, the primary objectives of the Anadromous Fish Restoration Plan for the next five year period are to continue the restoration of instream and riparian habitat and to improve fish passage for spring-run chinook salmon on Mill, Deer, and Butte creeks, and the Yuba River; to continue to restore the stream channels and eliminate predator ponds to improve survival of fall-run chinook salmon on San Joaquin River tributaries; to assist in meanderbelt and riparian habitat restoration for all anadromous species on the mainstem Sacramento River; and to continue to work with and through local watershed workgroups to study and plan for watershed and ecosystem restoration on key tributaries throughout the Central Valley (emphasis will be on Mill, Deer, Butte, Battle, and Big Chico creeks, the Yuba River, and the San Joaquin River tributaries).

Projects will be developed and implemented to complete the elimination of barriers to migration on Butte Creek; restore a riparian corridor along Mill, Deer, Big Chico, and Butte Creeks and the San Joaquin River tributaries; to complete the elimination of predator ponds on the Stanislaus and Tuolumne rivers; to acquire critical habitats for meanderbelt/riparian restoration on the mainstem Sacramento River; and to initiate the restoration of fish passage and habitat enhancement on Battle Creek.

Combined with water acquisition and the placement of fish screens at problem diversions, we expect these actions will stabilize populations of spring-run chinook salmon at an enhanced level on the tributary streams they currently use and to identify areas for expansion of habitat for this species. Similarly, we anticipate that improved spawning and rearing habitat, the elimination of predator ponds, and improved outmigration conditions will help to increase and stabilize populations of San Joaquin River fall-run chinook. Natural production of steelhead, fall-run chinook, and late fall-run chinook should begin to increase dramatically on Battle Creek and all species should benefit from actions on the Sacramento River mainstem. These actions will not only enhance the natural

production of target species but will benefit other species of fish (both resident and other anadromous species) and riparian oriented wildlife as well.

3406(b)(1) "Other" - CVP Habitat Restoration Program (including endangered species): Section 3406(b)(1) of the CVPIA requires that "the Secretary shall make all reasonable efforts consistent with the requirements of this section to address other identified adverse environmental impacts of the Central Valley Project not specifically enumerated in this section."

Initially, projects that address this "other" mitigation component have been or will be identified during other efforts, including but not limited to: (1) development and implementation of the Anadromous Fish Restoration Program; (2) Endangered Species Act Section 7 consultation for interim CVP contract renewals; (3) short- and long-term conservation programs being developed as a result of the Friant contract renewal consultation and CVP long-term contract renewals; (4) the CVPIA Programmatic Environmental Impact Statement; and (5) implementation of other CVPIA activities. Representative projects include the identification, protection, and restoration of habitat suitable for conservation of native species in areas impacted by the CVP.

However, over the long-term, a more planned and focused program will be implemented. This will entail the development of a "Project Plan" for the (b)(1) "other" program. Since many of the impacts of the CVP occurred years ago, an accurate assessment is impossible and the program will focus primarily on habitat types that are known or believed to have been impacted and what might reasonably be done to ameliorate those impacts. Consequently, it is anticipated that the Project Plan will be a framework document with the scope and extent of the program negotiated with the stakeholders based upon existing information on land use changes associated with project construction and operation.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

While the Project Plan is being developed, the program focus will be generally as described in section 4.3 above. Initial focus will be given to federally listed, proposed, or candidate species, other non-listed species of special concern, including non-anadromous fish and migratory birds, and habitat for those species. As information for the Project Plan is developed, the emphasis will shift to those habitats believed to have been most impacted by the CVP and which are in greatest need of protection/restoration. These will undoubtedly include riparian, grassland, and wetland habitats. Proposed actions during this period will entail a habitat trend analysis, development of the Project Plan, coordination with interested parties, and acquisition and restoration of select habitats as indicated above.

Biological benefits will depend upon the specific parcels acquired and/or restored but, regardless of the habitat or species focus, will benefit entire communities of species dependent on those habitat types. As the emphasis will be on habitats most impacted, the species afforded protection will likely also be those in greatest need. This program should contribute greatly to the recovery of listed species and to avoidance of listing for others.

3406(b)(2) Management of Dedicated CVP Yield (including pulse flows): Section 3406(b)(2) dedicated 800,000 acre-feet of CVP yield for the primary purpose of implementing fish, wildlife, and habitat restoration measures of the CVPIA; to assist in protecting the Bay-Delta Estuary; and to help meet other legally imposed obligations, including endangered species needs. Management and use of dedicated yield began in FY 1993. Efforts since that time have focused on resolving conflict over the definition and accounting for the dedicated yield and how it will be used in conjunction with the other water management tools provided by the Act. This culminated in a November 20, 1997 Administrative Proposal that described eight Delta measures and four upstream flow measures to be implemented and evaluated.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

Interior will continue to implement the delta and upstream measures described in the November 20, 1997 Administrative Proposal and to evaluate and adaptively adjust those measures as appropriate. It will also use the dedicated yield to continue to meet Interior's share of the flows required to meet the new State Water Resource Control Board standards. Rules and regulations will be developed and incorporated into routine project operations. Work will continue on coordination of water supply operations, the dedicated yield, and acquired and/or banked water; on review of effectiveness; and adaptive management.

Application of the dedicated yield will provide for fish, wildlife, and associated habitat restoration efforts and will increase the potential for integrated ecological management of all Central Valley fish and wildlife resources.

Anticipated biological benefits for anadromous fish include better instream temperatures for incubation and juvenile rearing, direct restoration of instream habitat, and more suitable migration conditions. Application of dedicated water to meet anadromous fish species needs will assist in the restoration of riparian and adjacent wetland habitats, estuarine areas, and will provide associated non-anadromous fish and wildlife species benefit.

3406(b)(3) Supplemental Water Acquisition Program: This section directs the Secretary to develop and implement, in conformance with fish and wildlife measures developed under 3406(b)(1), a program to acquire a water supply to supplement water provided under 3406(b)(2) to meet fish, wildlife, and

habitat restoration goals of the CVPIA. Potential sources of supplemental water include operational modifications; water banking; conservation; transfers; conjunctive use; and purchase, lease, and option of water, water rights, and associated agricultural land.

In 1995, an Interim Water Acquisition Program was developed to acquire temporary water supplies to meet immediate fish and wildlife restoration and enhancement goals of the CVPIA, while long-term planning continues.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The focus over the next five years will be to transition from annual acquisitions of the water necessary to meet anadromous fish and refuge Level 4 needs to a program of acquisition of long-term or permanent supplies and options for water. This will take place over a prolonged period of time because such acquisitions will be costly.

Acquisitions will be pursued to meet anadromous fish needs on Sacramento River tributaries, primarily for spring-run chinook and steelhead, and to obtain springtime out flows from San Joaquin River tributaries to implement the Vernalis Adaptive Management Plan. We will also need to increase the amounts acquired to meet refuge Level 4 requirements.

Anticipated benefits for fish and riparian species are similar to those described for Section 3406(b)(2) above except that the benefits will be largely on non-CVP controlled streams and in the estuary. The refuge water will benefit all waterfowl and other water oriented wildlife species associated with the federal and State refuges and the Grasslands Resource Conservation District.

3406(b)(4) Tracy Pumping Plant Mitigation: This program is designed to mitigate fishery impacts associated with operations of the Tracy Pumping Plant. The program includes, but is not limited to, the improvement or replacement of fish screens and fish recovery facilities and practices of the Tracy Pumping Plant.

Interim mitigation efforts to improve the Tracy Fish Collection Facility are continuing, while a long-term solution to Delta export problems is being developed. These efforts were initiated in 1992 following the execution of an agreement between Reclamation and CDFG. The agreement committed Reclamation and CDFG to take steps to improve the Tracy Fish Collection Facility which would result in reducing and offsetting direct fish losses.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The focus of the this effort at the Tracy Pumping Plant is commensurate with those expressed in section 4.1 above and will assist in offsetting the effects of entrainment, impingement, diversion, and increased predation which currently exist as a result of the facility. Solving entrainment problems at the Tracy Pumping Plant was described as a moderate priority by the Service in its 1994 funding priorities document.

Efforts for FY 1999 and beyond will be defined by a Planning Report on the Technical Feasibility of a Tracy Experimental Fish Facility (TEFF). Final engineering and design will be completed in FY 1999 following extensive interagency review with construction completed in FY 2000. The experimental facility will be developed to met the fish screen technology needs for the Tracy facility as well as the CALFED program, and will test and evaluate all aspects of fish salvage, sorting from debris, screening, transportation, sorting by size and species, and screen cleaning mechanisms.

Ultimately, the anticipated biological benefits of solving the entrainment problems include a reduction of impacts to, and direct improvement of juvenile survival for all salmon stocks, striped bass, and American shad. This will provide subsequent increases in other life stages as surviving juveniles enter the reproductive population. Estuarine species such as the Delta smelt may also benefit. It is estimated that approximately 50 million fish of over 40 species are handled at the Tracy fish facility annually, including 2 endangered species and other species of special concern. Maximizing environmental benefit, even after implementation of this program, will no doubt be closely related to hydrology and export. Benefits will also depend heavily on completion of the CALFED Bay/Delta Program.

3406(b)(5) Contra Costa Canal Pumping Plant: This Program is designed to mitigate fishery impacts resulting from operations of the Contra Costa Pumping Plant. It will provide for construction and operation of fish screening and recovery facilities, and for modified practices and operations.

The diversion at Rock Slough is one of the largest unscreened diversion sites currently in the Delta and a small number of resident and migratory fish species can be found in the canal including the endangered winter-run chinook salmon and threatened Delta smelt. As a result of the potential for pumping plant operations to impact these species, completion of the fish screen facility was also a commitment of ESA section 7 consultation for the Los Vaqueros project (September 1993).

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The focus of this section is commensurate with those expressed in section 4.1 above regarding delta diversions. Construction of this screening facility is designed to minimize the entrainment of fish

resources with the diversion of water at the Rock Slough Intake of the Contra Costa Canal, and reduce potential predation on anadromous fish and other species native to the Delta including the Delta smelt, and Sacramento splittail and blackfish. Screening the Contra Costa Canal Pumping Plant is listed as a lower priority action within the Service's 1994 priority documentation; however, screening is required within a specified time frame to comply with the biological opinion dealing with impacts to listed species.

Construction will begin in spring/summer of 1999 with the screening facilities planned for completion in 2000.

Anticipated biological benefits depend on selected screen and recovery facility configuration; however, any screen should provide an incremental increase to survival rates of juvenile anadromous fish species and Delta smelt within the Delta. However, the facility is not anticipated to provide significant benefits for egg and larvae of fish species due to the difficulty in screening these life stages.

3406(b)(9) Eliminate Flow Fluctuation Losses: The Secretary is directed to develop and implement a program to eliminate, to the extent possible, losses of anadromous fish due to flow fluctuations caused by the operation of any Central Valley Project storage or re-regulating facility. The program shall be patterned, where appropriate, after an existing agreement between the CDWR the CDFG, with respect to the operation of the California State Water Project Oroville Dam complex.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The focus of efforts associated with this section will be to provide for evaluations of existing flow management processes under sections 3406(b)(2) and 3406(b)(3) of the Act. These evaluations will assist in the adaptive management of our efforts to eliminate losses of anadromous fish due to flow fluctuations.

During the five year period, efforts will monitor the effectiveness of guidelines and provide input into flow management decisions to avoid the stranding of fish and improve the success of salmon spawning in the lower American, upper Sacramento, and lower Stanislaus rivers. Future actions will ensure appropriate implementation and continued coordination.

This measure is expected to yield significant biological benefits for anadromous fish species and will be integrated with, and considered part of, the management of dedicated CVP yield. Because many native non-anadromous fish species evolved in Central Valley rivers and streams with anadromous species, improved conditions for anadromous fish species should provide a benefit for these fish species as well.

3406(b)(10) Red Bluff Diversion Dam Fish Passage Program: This section requires the Secretary to develop and implement measures to minimize fish passage problems for adult and juvenile anadromous fish at the Red Bluff Diversion Dam in a manner providing for the use of associated CVP conveyance facilities for delivery of water to the Sacramento Valley National Wildlife Refuge complex.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The focus of the Red Bluff Diversion Dam Fish Passage Program over the next five years will be to increase the quantity of habitat for anadromous fish species; improve passage of juvenile fall-, late fall-, winter-, and spring-run chinook salmon and steelhead migrating downstream in the Sacramento River; improve upstream passage of adult anadromous species; provide water to diverters including the Sacramento National Wildlife Refuge; maintain Lake Red Bluff; select and implement a solution for fish passage; and determine if the facility can be operated without creating new attraction for predatory species while minimizing fish predation around structures associated with the facility.

Interior will utilize information gathered by the Service concerning juvenile and adult fish in the area of the diversion dam to better shape the long-term solution for fish passage at Red Bluff. Work will focus on formulating alternatives and performing analysis of impacts for the completion of the Environmental Impact Statement (EIS). FY 1999 efforts are expected to produce a draft EIS. Work will begin on conducting public and agency reviews of the EIS.

A comprehensive solution to anadromous fish passage problems at Red Bluff Diversion Dam will result in improved access to upstream spawning areas for winter-, spring- and fall-run chinook salmon and steelhead, and better survival rates for downstream migrating juveniles. In addition, sturgeon, which historically spawned above the dam but can not ascend fishways, would once again be able to pass Red Bluff throughout the year. Striped bass and American shad would also benefit incrementally from increased access to suitable habitat in the upper river. The solution to fish passage problems at Red Bluff Diversion Dam should result in more dependable water deliveries for all associated users, including the Sacramento Valley National Wildlife Refuge, thus benefiting associated wildlife species within the refuge complex.

3406(b)(11) Coleman National Fish Hatchery Restoration and Keswick Fish Trap Modification: The CVPIA directs the Secretary to both rehabilitate and expand, the Coleman National Fish Hatchery (CNFH) by implementing the existing plan, *USFWS Coleman National Fish Hatchery Development Plan*, and make changes at the Keswick Dam Fish Trap and spillway area to improve trap usability and prevent fish mortality at the base of the dam.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus of efforts associated with Coleman National Fish Hatchery will be to complete all necessary construction associated with meeting its mitigation requirements. Rehabilitation of the hatchery was identified as a moderate priority action in the 1994 draft report in Service funding priorities. However, based on the focus for the five year period, restoration of natural production in Battle Creek is a high priority. Protection of the hatchery's water supply is a necessary pre-condition to the restoration of the 42 miles of stream above the hatchery. This elevates the importance of a treated water supply in the overall priorities for the CVPIA.

In FY 1999 work will continue at the hatchery on the water treatment system. This will include the construction of a new Coleman Canal intake and installation of the oxygen generators, ozone generators, contact chambers, and gas strippers. By the end of FY 1999, we expect to have operational capability to filter 45,000 gpm and ozonate 30,000 gpm, enough to safely (we think) initiate restoration of wild fish into the watershed above the hatchery's water supply. Although the Station Development Plan identified a target of 45,000 gpm filtered and 45,000 gpm treated for the hatchery at its current size, it is believed that 30,000 gpm will prove adequate to effectively control disease. In FY 1999-2002, the water treatment system will be monitored to determine the adequacy of the treatment levels in control of disease pathogens and of the need for increased levels of treatment. The Keswick Fish Trap will require a test phase in FY 1999. Modifications may be required after testing and operations during high water releases. Additional design changes and construction may be required due to these potential modifications.

Implementing the Coleman Plan will provide benefits for anadromous fish species in the Sacramento basin. It will enhance operation of the fish hatchery, leading to production of more and healthier hatchery raised chinook salmon and steelhead. Disease in both chinook salmon and steelhead has been a continual problem, due in part to water borne pathogens. There are 13 known disease causing organisms in the hatchery's water supply including whirling disease, IHN (viral infection) and various common bacterial and fungal diseases. Modification of the Keswick Dam Fish Trap will improve survival of associated anadromous fish trapped at the facility, thus providing additional adults and subsequent egg production for inclusion in hatchery operations.

3406(b)(12) Clear Creek Fishery Restoration: The CVPIA requires a comprehensive program to provide flows from Whiskeytown Dam for salmon and steelhead production in Clear Creek after improvements to stream habitat and passage problems at McCormick-Saeltzer dam are solved. Restoration activities will focus on increasing minimum flows, erosions control, and passage of anadromous fish beyond the existing site of the McCormick-Saeltzer Dam which serves as a migration barrier to approximately 10 miles of upstream habitat.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus of the Clear Creek Restoration Program will be to provide spring-, and fall-run chinook salmon and steelhead passage at Saeltzer Dam, increasing access to upstream habitats; to restore stream channel form and function necessary to optimize habitat for salmon and steelhead and to the aquatic and terrestrial communities on which they are dependent; provide flows of quality and quantity to meet the requirements of all life stages of chinook salmon and steelhead; and to reduce watershed erosion and sedimentation.

Restoration actions during the five year period will include continued implementation of the stream corridor survey, effects monitoring, the watershed erosion inventory and control program, and evaluation and implementation of a means to allow anadromous fish species to travel beyond the existing site of the McCormick-Saeltzer Dam.

Restoration efforts associated with the Clear Creek watershed will benefit anadromous fish species. Clear Creek provides about two percent of current upper Sacramento River salmon escapement, and the stream's rehabilitation would improve the overall capacity of the Central Valley system. Additionally, stream restoration activities would potentially benefit riparian and adjacent wetland habitats and associated wildlife species.

3406(b)(13) Gravel Replenishment and Riparian Habitat Protection: The CVPIA directs the Secretary to develop and implement a continuing program for the purpose of restoring and replenishing, as needed, spawning gravel lost due to the construction and operation of CVP dams, bank protection projects, and other actions that have reduced the availability of spawning gravel and rearing habitat in the Upper Sacramento River from Keswick Dam to Red Bluff Diversion Dam, and in the American and Stanislaus rivers downstream from Nimbus and Goodwin dams, respectively. Gravel restoration projects on the Sacramento River were initiated below Keswick Dam in 1995.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus of this section provides for increases of and/or improvement in spawning habitat for Sacramento River Basin, and American and Stanislaus river chinook salmon and steelhead. During this five year period, activities will include: the placement of spawning gravel in the Sacramento River between Keswick Dam and Clear Creek as part of the long-term restoration/protection plan for the Sacramento River, coordination and implementation of appropriate actions, identified as feasible in FY 1997 by an interagency Federal/State technical team; placement of spawning gravel and channel reconfiguration in the Stanislaus River downstream from Goodwin Dam as part of the long-term spawning habitat restoration plan for the Stanislaus River; overseeing and evaluating data; monitoring the success of spawning gravel/habitat restoration actions previously implemented; and initiating a pilot gravel management project on the American River.

Direct replacement of spawning gravel will benefit chinook salmon and steelhead by ensuring that spawning is possible below project dams. Development of meander belts and bank protection limitations will not only ensure availability of a natural source of gravel, but will allow the development of alluvial river channels and riparian vegetation. A natural channel and riparian pattern will provide important fish rearing habitat. The restoration of a natural channel will also increase adjacent terrestrial habitats for a multitude of wildlife species, including several currently listed as threatened or endangered.

3406(b)(14) Delta Cross Channel and Georgiana Slough: This section requires the Secretary to develop and implement a program which provides for modified operations and new or improved control structures at the Delta Cross Channel and Georgiana Slough during times when significant numbers of striped bass eggs, larvae, and juveniles approach the Sacramento River intake to the Delta Cross Channel or Georgiana Slough.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The current five year focus of this section is to provide a continuation of administrative review and coordination with on-going activities, being conducted by others, designed to evaluate the possibility of modified operations, and new or improved structures.

Implementation of a program under Section 3406(b)(14) will potentially benefit anadromous fish species addressed by the CVPIA. Measures involving modification of system-wide operations such as pumping schedules and Sacramento River flows could substantially reduce striped bass mortality throughout the Delta, while reducing entrainment at the Cross Channel and Georgiana Slough as well. Modified operations and/or new or improved structures will benefit other anadromous fishes which experience increased mortality when drawn into the central Delta by Federal and State pumps operation.

3406(b)(15) Old River Seasonal Barrier (evaluation of effectiveness): This section calls for the construction of a fish barrier at the head of Old River to be operated on a seasonal basis to improve fish migration in the San Joaquin River. The barrier is to be constructed in a manner that will not impact the local water diversions.

An evaluation of the effectiveness of the barrier in relation to flow, water temperature, and delta export pumping is needed to determine the usefulness of the facility. Such an evaluation would also help to quantify the potential magnitude of impacts to other species.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus of CVPIA efforts associated with the barrier at the Head of Old River will be to work with other entities to complete necessary evaluations on the effectiveness and impact, to all aquatic and terrestrial species, of any barrier in this location.

During FY 1999 through 2003, funding will be used to reimburse CDWR for up-front funding of the temporary barrier at the head of Old River and continuation of preliminary activities [NEPA/California Environmental Quality Act (CEQA) compliance], permit application, and gathering of preliminary design data related to any potential implementation of this program.

The barrier could reduce diversion of young salmon into the south Delta and improve overall survival rates, although it would also complicate management of species such as the Delta smelt by increasing reverse flows in channels lower on the San Joaquin River.

3406(b)(16) Comprehensive Assessment and Monitoring Program (CAMP): The CVPIA authorizes and directs the Secretary to establish, in cooperation with independent entities and the State of California, a comprehensive program to monitor fish and wildlife to assess the biological results and effectiveness of restoration efforts in provisions found in section 3406(b).

The monitoring program is closely tied to the AFRP and the program for mitigation of other Central Valley Project impacts. Most other elements of Section 3406(b) will also require specific monitoring elements whose results will be available for evaluation in the overall assessment program. Monitoring efforts will complement Section 3406(g), providing input to ecologic models and using model output to aid in assessment of restoration effectiveness.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The assessment and monitoring program will measure the success and continued improvement of restoration efforts associated with implementing biological restoration actions found in the CVPIA. During this period activities will include: overseeing annual fish assessment activities to be conducted by local, State, and federal entities (to be continued in subsequent years); a survey of anglers in Central Valley streams will be conducted to determine the contribution sport fishing catch will provide to estimates of success associated with the goal of doubling populations of anadromous fish; a count of adult salmon at hatcheries and in Central Valley streams, including enumeration and location of salmon redds (nests) and of spent salmon carcasses in the streams to determine the size and distribution of salmon populations; marking young salmon and steelhead produced in hatcheries to determine the relative contribution of hatchery-produced fish to the overall total population; help fund and oversee annual counts of juvenile fish in representative streams to determine the relative

success of categories of fish restoration actions (i.e. water management, fish screen, habitat restoration and structural modifications; and continue a data storage and retrieval system established with the data management program of the IEP for the Sacramento-San Joaquin Bay-Delta Estuary.

By providing a means of evaluating restoration measures and allowing for more appropriate adaptive management, it is anticipated that this program will provide an indirect general benefit to all species and habitat types addressed under the CVPIA.

3406(b)(17) Anderson-Cottonwood Irrigation District Fish Passage: This section directs the Secretary to develop and implement a program to resolve fishery passage problems at the Anderson-Cottonwood Irrigation District (ACID) Diversion Dam as well as upstream stranding problems related to ACID Diversion Dam operations. The fish ladders at ACID are inefficient and can impede adult salmon, including endangered winter-run chinook and proposed spring-run chinook salmon, from reaching spawning areas. The solution may be improved fish ladders, dam modifications, or a new fish trap.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus of efforts associated with fish passage at the Anderson-Cottonwood Irrigation District will be to eliminate or avoid the de-watering of redds and stranding of juveniles caused by operation of the ACID diversion and Keswick dams; to improve fish passage, and decreased injury, at ACID, increasing access to 3 miles of habitat between ACID diversion and Keswick dams; and the reduction of entrainment of juveniles salmonids.

Actions during the five year period will involve continued and increasing participation in efforts to identify and evaluate alternative long-term solutions. In addition, the existing fish screen at ACID may require additional improvement as a result of its lightweight construction which is now wearing out. This component, if found to warrant action, will be referred to the Anadromous Fish Screen Program for solution.

Completion of this mitigation program will improve access to three miles of spawning and rearing habitat for chinook salmon, predominantly winter-run, upstream of the ACID Diversion Dam facility.

3406(b)(18) Restore Striped Bass Fishery: This section directs the Secretary of the Interior to assist the State of California, if requested, in the development and implementation of management measures to restore the striped bass fishery of the Bay-Delta estuary. Such measures shall be coordinated with efforts to protect and restore native fisheries.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

No action under this provision of the Act is proposed or anticipated at this time. Instead, we are focusing our efforts on the Anadromous Fish Restoration Program [section 3406(b)(91)] which will provide substantial benefit to striped bass.

3406(b)(19) Shasta and Trinity Reservoir Carryover Storage Studies: The CVPIA calls for the reevaluation of operational criteria in order to maintain minimum carryover storage at Sacramento and Trinity River reservoirs to protect and restore the anadromous fishes of the Sacramento and Trinity rivers in accordance with mandates and requirements of this section, subject to the Secretary's responsibility to fulfill all project purposes, including agricultural water delivery.

There are a number of actions underway which will influence this study, including the development of criteria for dedication and management of CVP yield under 3406(b)(2), and operation of the Trinity River under the Trinity River Restoration Program which will affect project operations by meeting other purposes. The relationship of these actions to carryover needs will be evaluated.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus of efforts associated with this section will seek to maintain minimum carryover storage at Sacramento and Trinity River reservoirs to protect and restore associated anadromous fish species. These species include the winter-, spring-, late fall-, and fall-run chinook salmon and steelhead in the Sacramento River Basin, and winter- and spring-run chinook salmon, coho salmon, and steelhead in the Trinity River basin.

During this period, efforts will be needed to refine operational criteria and monitor any results.

Any anadromous fish biological benefits, accrued as a result of this provision, would be included as part of 3406(b)(2), Dedicated CVP Yield.

3406(b)(20) Glenn-Colusa Irrigation District (GCID) Pumping Plant: This section requires Interior to participate with the State of California and other Federal agencies in the implementation of an ongoing program to mitigate fully for fishery impacts associated with operations of the Glenn-Colusa Irrigation District's Hamilton City Pumping Plant. Such participation includes the replacement of defective fish screens and fish recovery facilities associated with the plant.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus of the program to mitigate fishery impacts associated with operations of the Glenn-Colusa Irrigation District's Hamilton City Pumping plant will be to eliminate loss or damage to anadromous fish species in the Sacramento River (all species) from water diversion at the Plant; to provide long-term capability to divert water for the Sacramento National Wildlife Refuge complex to maintain existing habitat for significant species; and to permit GCID to divert up to 3,000 cfs from the Sacramento River as per associated rights and allocations.

During this period, the project will focus on continuing the construction of the screen facility, cofferdam and underwater site. Once complete, evaluation of the operation of the facility will begin. Correction of the existing screening process for the Glenn-Colusa Irrigation District will benefit anadromous species restoration. Because most juvenile fish produced in the Sacramento River and basin tributaries must pass the Hamilton City Pumping Plant, its diversion of 20 to 30 percent of total river flows has resulted in the loss of millions of juvenile salmon annually. It is estimated that effective screening would reduce this mortality to insignificant levels, with corresponding increases in the number of returning adults. Correction of the screening process for the Glenn-Colusa Irrigation District diversion may provide a more certain water supply to refuges, benefiting wetland dependent species within the Sacramento Valley.

3406(b)(21) Anadromous Fish Screen Program: This section authorizes the Secretary to assist the State of California in its effort to develop and implement measures to avoid losses of juvenile anadromous fish resulting from unscreened or inadequately screened diversions on Central Valley waterways. Measures shall include but not be limited to the construction of screens on unscreened diversions, rehabilitation of existing screens, replacement of existing non-functioning screens, and relocation of diversions to less fishery-sensitive areas.

Measures shall include, but not be limited to, the construction of screens on unscreened diversions, rehabilitation of existing screens, replacement of existing nonfunctioning screens, and relocation of diversions to less fishery-sensitive areas.

The Anadromous Fish Screen Program is voluntary, making it difficult to predict the number of program related screening projects in the future. However, of those diverters applying for inclusion, the program applies standards to ensure selected projects are of high priority.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus for the Anadromous Fish Screen Program is to protect juvenile chinook salmon, all runs, steelhead, sturgeon, striped bass and American shad from entrainment by as many "offending" diversions from the Central Valley's river system as possible, on a priority basis.

Those projects which are not funded in FY 1998 will be considered for funding during FY 1999, as will any new project proposal submitted to the program. In addition to several major projects currently being evaluated, there are numerous smaller projects on the horizon. If adequate funds are available, it is estimated that approximately 100 diversions of 100 to 200 cfs per diversion and larger may be screened over the next five years.

Appropriate screening of diversions is anticipated to reduce a substantial cumulative source of mortality for anadromous and resident fish species. Unscreened diversions, from small tributaries such as Butte Creek, to the salt-water interface near Suisun Bay, affect anadromous fish throughout their juvenile stages. The development of a basin-wide screen program, in a context of cooperation and partnership, is the most promising strategy for control of juvenile anadromous fish losses associated with agricultural, municipal, and industrial diversion.

3406(b)(22) *Agricultural Waterfowl Incentives Program:* This section directs the Secretary to provide incentives as determined to be appropriate or necessary, to encourage farmers to participate in a program under which they (farmers) will keep fields flooded during appropriate periods for the purposes of waterfowl habitat creation and maintenance, and for CVP yield enhancement. The incentives are not to exceed \$2,000,000 per year, either directly or through credits against other contractual payment obligations, including tiered pricing waivers. This program is scheduled to terminate on December 31, 2001, in accordance with its CVPIA authorization.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The focus of the five year period will continue implementation utilizing the interim guidelines. It is estimated that approximately 15,000-50,000 acres will be enrolled annually. Waterfowl use on the enrolled areas will be monitored to evaluate the benefits that accrue.

The primary program benefit will be to waterfowl and wetland dependent migratory birds. It will expand waterfowl wetland habitat in the Valley, which will encourage wider distribution of waterfowl populations, decrease disease potential, and increase available food resources. A properly focused program will provide wetland habitat benefits throughout the Central Valley.

3406(c)(2) Stanislaus River Basin Fish and Wildlife Needs Assessment: Section 3406(c)(2) of the CVPIA requires an investigation to evaluate and determine the existing and anticipated future basin needs in the Stanislaus River Basin, including investigations of alternative storage, release, and delivery regimes. These basin needs were defined as water supply for agricultural, municipal and industrial uses; maintaining and enhancing water quality; and that necessary to meet the needs of fish and wildlife resources in the basin.

On March 26, 1993, Reclamation and the California Department of Water Resources (DWR) signed a Memorandum of Agreement that described each agency's role in the preparation of an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Stanislaus River Basin and Calaveras River Water Use Program. Reclamation began development of a surface water model for use in analyzing alternatives, and developed a temperature model of the Calaveras River. DWR began development of a groundwater model and worked with Reclamation to complete operational studies. Additionally, the Service completed an initial terrestrial Habitat Evaluation Procedure (HEP) for the Stanislaus River riparian corridor.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus of this effort within the Stanislaus River Basin will be to continue to evaluate fish and wildlife needs as necessary, although completion of the environmental documentation is currently on hold.

If implemented, actions proposed within the report could benefit anadromous fishes by providing more appropriate instream flows improving anadromous fish survival. Additionally, collateral benefit will be provided to wildlife and resident fish species as a result of increased instream flow and associated riparian habitat restoration.

3406(d) Refuge Water Supply and Conveyance: This section directs the Secretary to provide firm water supplies of suitable quality to maintain and improve wetland areas on certain Central Valley National Wildlife Refuges, State Wildlife Management Areas, and the Grassland Resources Conservation District.

Section 3406(d)(1) required that upon enactment of the CVPIA, the quantity and delivery schedules of water measured at the boundaries of each wetland habitat area shall be in accordance with Level 2 "Dependable Water Supply Needs" identified in the *Refuge Water Supply Report* (USBR, 1989) and two-thirds of the water supply needed for full habitat development for those habitat areas identified in the *San Joaquin Basin Action Plan/Kesterson Mitigation Action Plan Report*. Section 3406(d)(2) requires the Secretary to provide, not later than ten years after enactment, the quantity and delivery schedules of water measured at the boundaries of each wetland habitat area in

accordance with Level 4 water supplies necessary for full habitat development as identified in the above two reports. The Level 4 supply is to be acquired from voluntary providers in not less than 10 percent increments per year.

Section 3406(d)(5) authorizes the Secretary to construct or to acquire from non-federal entities such water conveyance facilities, conveyance capacity, and wells as necessary to implement the refuge water supply requirements. This authorization does not include conveyance facilities in or around the Sacramento-San Joaquin Delta Estuary.

The Level 2 water supply increment is provided by the Central Valley Project while the Level 4 increment is acquired pursuant to Section 3406(b)(3) of the CVPIA. Consequently, the primary focus of this program is the conveyance of those supplies to the various wetland habitat areas.

The *Report of Recommended Alternatives, Refuge Water Supply and San Joaquin Basin Action Plan Lands* (Decision Document), published in April 1995, analyzed alternative means of conveying supplies to the refuges. The feasibility of those conveyance alternatives identified in the Decision Document were verified through public involvement workshops, stakeholders meetings, and field investigations. The *Refuge Water Supply Conveyance Alternatives Refinement Memorandum* (Memorandum), published in May 1995, summarized the results of alternative refinement studies for Sacramento, Delevan, Colusa, Sutter, Gray Lodge, Kern, and Pixley refuges presented in the Decision Document. Alternatives being pursued include use of existing private and public facilities, construction of new facilities, and combinations thereof.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The focus of the five year period will continue to be the negotiation of agreements with water districts to "wheel" water to the various wetland habitat areas through existing facilities and, where more efficient, effective, or necessary, to construct new facilities to convey the requisite supplies. By Fiscal Year 2003, we expect to have completed construction of the Stoney Creek Siphon Project to convey water to the Sacramento National Wildlife Refuge Complex, facilities to convey water to grey Lodge and Mendota Wildlife Management Areas and to the Sutter, Kern, and Pixley National Wildlife Refuges. In addition, canals, turnouts from the Delta Mendota Canal, and modifications to other existing facilities will be completed to provide water to the San Joaquin Basin Action Plan lands. We also expect to have long-term agreements in place with water districts to use existing facilities sufficient to meet all remaining refuge water supply obligations.

The water supplies authorized by the CVPIA will enable land managers to fully develop the potential of these habitat areas for the first time. The quality and diversity of habitat will dramatically improve as vegetation responds to enhanced water management practices. This will in turn benefit

waterfowl and other wildlife resources, will result in healthier populations, and will enable the recovery of many species that have suffered due to inadequate habitat.

3406(g) Ecological and Hydrologic Models: Section 3406(g) requires the Secretary to develop readily usable and broadly available models and supporting data to evaluate the ecologic and hydrologic effect of public and private water facility operations in the Central Valley and Trinity River watersheds.

The goal is to provide an integrated evaluation of the effectiveness of various components of the CVPIA, permitting water delivery operations that efficiently maximize the biological stability of the Central Valley. Improved models will help in the technical evaluations associated with preparation of NEPA documents, in the water accounting process, and in setting priorities among restoration measures. These tasks will improve the ability to predict and understand the effects of proposed actions and changes on project operations and ecosystems, and to obtain general consensus of users and managers on the validity and useability of available models. This program will be implemented using cost-sharing between Interior and the State of California as required under the CVPIA.

This program will result in readily useable and broadly available ecosystem models which will improve resource management planning, allow for evaluations of adaptive management methods, and permit evaluation of alternative actions and scientific assumptions by all interested parties.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

Improving model user interfaces and daily model development and calibration will continue. Work has started in developing and calibrating temperature models for critical reservoirs and streams, and in groundwater models, including participation in the Kern Area Groundwater Model analysis. Work is underway on a chinook salmon life-history model and models of the relationships between Sacramento River flows and riparian vegetation.

Development of species-specific models, such as the Sacramento River chinook salmon population models, will continue in the five year planning period. Development of models of the hydrological effects on stream riparian habitat, evaluation of wetland and natural channel models, and participation in development of 3-D estuarine hydrodynamic and salt transport models is underway and will also continue.

Since the effort is intended to support sound resource management through improved scientific understanding, anticipated biological benefits are non-specific but comprehensive, including improvements, when modeling is combined with planning and assessment elements, in the management of all species and habitat types in the Central Valley.

3408(h) Land Retirement: This section authorizes the Secretary to purchase land from willing sellers (and associated water rights) which would, if permanently retired from irrigated agriculture, improve water conservation efforts and the quality of irrigation waste water. It could also purchase lands no longer suitable for sustained agricultural production because of permanent damage resulting from severe drainage or agricultural wastewater management problems, groundwater withdrawals, or other causes.

The Land Retirement Program may prove to be a source for supplemental water acquisition; may assist with recovery of wildlife resources in the Central Valley, including endangered species; and has the potential to be a positive move towards resolving water quality issues of the San Joaquin River and Tulare Lake basins.

Retirement of irrigated farmland is one component of the plan to manage drainage-related problems along the center and western side of the San Joaquin Valley. The land retirement program may contribute greatly to the recovery of several listed species when operated to solve both endangered species recovery and contaminant problems as its two principal objectives. Retiring large blocks of irrigated farmland is better suited to meeting these objectives.

At the present time the retirement of land is accomplished under Interim Guidelines and existing Federal regulations. The program is considered a pilot or demonstration program. Until the development of a long-term plan, with accompanying rules and regulations, the interim demonstration program will continue. The interim program is based on a competitive process, designed to provide maximum flexibility to the government in selecting and retiring lands.

Five Year Restoration Focus, Proposed Actions, and Anticipated Biological Benefits

The five year focus of the Land Retirement Program will be to reduce generation of subsurface drainage water or otherwise contribute to better drainage management; to contribute to restoration and protection of wildlife resources; to restore and protect aquatic species in the San Joaquin River by improving water quality; and acquiring associated water rights for CVPIA beneficial uses.

The program will continue to evaluate and retire farmland during the focus period. The amount of farmland retired will be determined by the negotiated price offered and accepted by willing sellers. Rules and Regulations are being established for the development of long-term guidelines and will be released during FY 1999.

The land retirement program can potentially benefit many fish, wildlife and associated habitats in the Central Valley. The retirement of lands and the subsequent reduction of highly saline and toxic drainage flows now entering the San Joaquin River will benefit anadromous fish. The potential

purchase of water with land acquisition can supplement instream flows, assisting in meeting attraction, spawning, and down stream migration flow needs of anadromous fish species. Reductions in saline and toxic drainage will also benefit non-anadromous fish species, wildlife and associated habitats in the San Joaquin Valley. Additionally, retired agricultural lands, once restored, can provide habitat, assisting with the recovery of several Federal and State listed endangered species, and other wildlife populations which have declined with agricultural and irrigation development. Such lands can, if appropriate, be added to existing Federal and State refuge systems, or be placed under agreement with local entities or landowners for management purposes.

7. Funding

The CVPIA provides the Restoration Fund, a source of funding established pursuant to Section 3407 to assist in the mitigation, restoration, and recovery of habitat and species in the Central Valley. Interior recognizes and accepts that mitigation for impacts of the CVP on fish and wildlife, including endangered species, will be met in large part through the Restoration Fund and other resource measures created by the CVPIA. Additional funding to assist in recovery of fish and wildlife in the Central Valley will be needed from other sources such as non-reimbursable Department of the Interior appropriations, Category III under the Bay-Delta Accord, the State of California, donations to the Restoration Fund, etc. Additionally, it is Interior's understanding that if additional impacts to fish and wildlife occur as a result of changes in the project or its operation, there may be additional mitigation or action required of Reclamation and/or the water and power contractors to compensate for the effects occasioned by those changes. Interior will use the appropriate processes to address such issues if they occur.

8. FY 1999-2003 Budget Plan

Table 7 provides Interior's Proposed Five-Year Budget Plan for CVPIA efforts from FY 1999 to FY 2003 and takes into account conclusions reached in this report leading to the program focus as defined in Sections 4 and 6. Table 6, organized by budget category, includes the application of Restoration Funds and projected amounts in Reclamation's Water and Related Resources appropriation and anticipated participation by the State of California. Interior recognizes other funding sources will also be available. However, because we cannot estimate them or match them to specific projects at this time, they are not displayed. The amounts displayed are based on project managers' estimates of cost to perform the job and are subject to change as more information is developed. The estimates attempt to reflect the full cost of what it will take to get the job done. This includes necessary studies, engineering and design, environmental compliance costs, and staff time to the extent its a necessary component of project management. Interior has and will continue to

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emphasize implementation, with a reduced emphasis on plans and studies that were an essential part of some provisions in the first five years of implementing the CVPIA (e.g. development of the Anadromous Fish Restoration Plan).

As described earlier, the budget reflects a level of uncertainty. Several CVPIA programs are dependent on willing participants, either for cost-sharing, cooperation, or implementation, and will be somewhat reactive in nature. Budget requirements will no doubt change depending on the degree of interest or the availability of willing sellers.

Table 6
CVPIA 5-YEAR BUDGET PLAN
FY 1999-2003
(\$ Thousands)

Description		Cost Auth #	FY 99			FY 00			FY 01			FY 02			FY 03			Total by Project
			WRR	RF	State	WRR	RF	State	WRR	RF	State	WRR	RF	State	WRR	RF	State	
3406(b)(1)	Anadromous Fish Restoration	0214		8,000			7,000			7,000			7,000			7,000		36,000
3406(b)(1)"other"	Habitat Restoration Program	0214		1,533			2,000			1,500			1,500			1,500		8,033
3406(b)(2)	Dedicated Project Yield	0214		1,274			1,000			250			250			250		3,024
3406(b)(3)	Water Acquisition	1205	2,000	12,990	5,300		10,000	4,000	3,000	13,600	4,000	3,000	14,993		4,000	15,000		91,883
3406(b)(4)	Tracy Pumping Plant	0863	500	1,000		1,150							3,000			3,029		8,679
3406(b)(5)	Contra Costa Canal Pump	0863	250		8,900	100												9,250
3406(b)(9)	Flow Fluctuation Study	0214		200			50						200			200		650
3406(b)(10)	Red Bluff Diversion dam	0725	1,860			3,604			4,000			13,008			12,000			34,472
3406(b)(11)	Coleman Fish Hatchery	1741	1,500	1,750		1,500												4,750
3406(b)(11)	Keswick Fish Trap Modifications	1741	150															150
3406(b)(12)	Clear Creek Restoration	1741	500		2,000	100	1,000	1,400		1,000			1,000			1,000		8,000
3406(b)(13)	Spawning Gravel/Riparian Habitat	214		50	950		50	950		500			1,000			1,000		4,500
3406(b)(14)	Delta Cross Channel/Georgiana Slough	0863																
3406(b)(15)	Old River Barrier	0863	16															16
3406(b)(16)	Comp Assess Monitoring Program	0214		2,500			1,000			1,250			1,250			1,500		7,500
3406(b)(17)	Anderson-Cottonwood ID	1741					50						3,000			2,000		5,050
3406(b)(19)	Reservoir Storage	0214		50			50						50			50		200
3406(b)(20)	GCID-Hamilton City Pump Plant	0725	7,900		1,500	4,752			5,684									19,836
3406(b)(21)	Anadromous Fish Screen Program	0214	1,361	5,100	4,500	1,000	2,000	4,500		3,000	4,500		3,000		2,000	1,500		32,461
3406(b)(22)	Ag Waterfowl Incentive Program	0214		1,000			1,000			1,000			1,000			1,000		5,000

WRR- Water and Related Resources Appropriations

RF - Restoration Fund [3407]

State - State of California funding, including Prop 204, CVPIA past cost-share funds, etc.

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Table 6
CVPIA 5-YEAR BUDGET PLAN
FY 1999-2003
(\$ Thousands)

Description		Cost Auth #	FY 99			FY 00			FY 01			FY 02			FY 03			Total by Project
			WRR	RF	State	WRR	RF	State	WRR	RF	State	WRR	RF	State	WRR	RF	State	
3406(c)(2)	Stanislaus River Basin Water Needs						100											100
3406(d)(1, 2 & 5)	Refuge Water Conveyance		7,400	10,000	2,860	1,900	13,000	388	2,870	7,660			10,250			8,248		64,576
	Facility Construction	0214	(3,500)	(1,780)	(2,860)		(4,500)		(347)	(2,660)			(2,500)			(248)		
	Refuge Wheeling	0214	(2,000)	(5,000)			(6,900)	(388)	(2,523)	(5,000)			(7,750)			(8,000)		
	San Joaquin Basin Action Plan	1205	(1,900)	(3,220)		(1,900)	(1,600)											
3406(g)	Ecosys.\Water System Ops Model	0214	1,000			1,000				500			500					3,000
3408(h)	Land Retirement	1205	4,000	4,000	5,000		5,830			8,000			8,000			4,000		38,830
TOTAL			28,437	49,447	31,010	15,106	44,130	11,238	15,554	45,260	8,500	16,008	55,993		18,000	47,277		385,960
33% Share				11,400			5,100			6,750			13,250			11,029		47,529
67% Share				38,047			39,030			38,510			42,743			36,248		194,578
ANNUAL TOTAL			108,894			70,474			69,314			72,001			65,277			385,960

** FY 01-FY 03 Water and Related Resources Appropriations are displayed as amounts that might be reasonably appropriated each year. These figures could significantly change in the Congressional Appropriations process. The annual Restoration Fund budgets were estimates taking into account the three-year rolling average. All of these estimates will be adjusted annually as Restoration Fund collections are realized.

WRR- Water and Related Resources Appropriations

RF - Restoration Fund [3407]

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